

CLAIMS

1. A displacement sensor for automatically extracting a coordinate of a measuring point from an image obtained by using an imaging device according to a prescribed measuring point extraction algorithm, and computing a desired displacement from the automatically extracted measuring point coordinate, characterized by that:

the sensor further comprises display data editing means for editing at least part of data used from the time of obtaining the image until the time of computing the displacement for use as display data for an image monitor.

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2. A displacement sensor according to claim 1, wherein the imaging device consists of a two-dimensional imaging device.

15 3. A displacement sensor according to claim 1, wherein the display data for the image monitor comprises a raw image obtained by the imaging device.

20 4. A displacement sensor according to claim 3, wherein the display data for the image monitor further comprises a graphic image indicating a measuring point coordinate which is shown in association with the raw image.

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5. A displacement sensor according to claim 3, wherein the display data for the image monitor further comprises a graphic image indicating a tolerance range for a measurement value in a direction for measuring the displacement which is shown in association with the raw image.

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*Step 5*

6. A displacement sensor according to claim 3, wherein the display data for the image monitor further comprises a graphic image indicating a measuring point coordinate and a tolerance range for a measurement value in a direction for measuring the displacement which are shown in association with the raw image.

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7. A displacement sensor according to claim 3, wherein the editing means is adapted to enlarge an image based on the display data in the direction for displacement measurement.

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8. A displacement sensor according to claim 1, wherein the display data comprises an image of a line bright waveform obtained from a raw image.

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9. A displacement sensor according to claim 8, wherein the display data further comprises a graphic image indicating a measuring point coordinate shown in association with the line bright waveform.

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10. A displacement sensor according to claim 8, wherein the display data further comprises a graphic image indicating a threshold level for extracting the measuring point coordinate shown in association with the line bright waveform.

11. A displacement sensor according to claim 8, wherein the display data further comprises a graphic image indicating a tolerance range for a measurement value in a direction for measuring the displacement which is shown in association with the line bright waveform.

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12. A displacement sensor according to claim 8, wherein the display data further comprises a graphic image indicating a measuring point coordinate and a tolerance range for a measurement value in a direction for measuring the displacement which is shown in association with the line bright waveform.

13. A displacement sensor according to claim 8, wherein the editing means is adapted to enlarge an image based on the display data in the direction for displacement measurement.

10 14. A displacement sensor according to claim 1, wherein the display data for the image monitor comprises a raw image obtained from the imaging device and a line bright waveform obtained from the raw image for display on a monitor in a prescribed relationship.

15 15. A displacement sensor according to claim 14, wherein the display data further comprises a graphic image indicating a measuring point coordinate shown in association with the raw image and/or the line bright waveform.

20 16. A displacement sensor according to claim 14, wherein the display data further comprises a graphic image indicating a tolerance range for a measurement value in a direction for measuring the displacement shown in association with the raw image and/or the line bright waveform.

25 17. A displacement sensor according to claim 14, wherein the display data further comprises a graphic image indicating a measuring point coordinate and a tolerance

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range for a measurement value in a direction for measuring the displacement in association with the raw image and/or the line bright waveform.

5 18. A displacement sensor according to claim 14, wherein the editing means is adapted to enlarge an image based on the display data in the direction for displacement measurement.

10 19. A displacement sensor according to claim 3, wherein the display data further comprises a graphic image indicating a measuring point extracting range defined in a direction perpendicular to the direction of displacement measurement which is shown in association with the raw image.

15 20. A displacement sensor according to claim 3, wherein the display data further comprises a graphic image indicating a measuring point extracting range defined in a direction perpendicular to the direction of displacement measurement and an automatically extracted measuring point coordinate which is shown in association with the raw image.

20 21. A displacement sensor according to claim 1, wherein the display data comprises a trend graph image showing a plurality of computed displacements in a time sequence.

25 22. A displacement sensor for automatically extracting a coordinate of a measuring point from an image obtained by using an imaging device according to a prescribed measuring point extraction algorithm, and computing a desired displacement from the

automatically extracted measuring point coordinate, further comprising:

means for defining a measuring point extraction range in association with the image obtained by the imaging device; and

means for automatically extracting a measuring point coordinate from a part of  
5 the image within the measuring point extraction range according to a prescribed  
measuring point extraction algorithm.

23. A displacement sensor according to claim 22, wherein the measuring point extraction range is defined in the direction for displacement measurement.

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24. A displacement sensor according to claim 22, wherein the imaging device consists of a two-dimensional imaging device, and the measuring point extraction range is defined in a direction perpendicular to the direction for displacement measurement.

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25. A displacement sensor system, comprising:

at least one sensor head incorporated with a light source for generating a light section beam and an imaging device for imaging an object to be measured which is illuminated by the light section beam;

20 a main unit connected to the sensor head or the sensor heads with an electric cord, the main unit being adapted to automatically extract a coordinate of a measuring point from an image obtained by the sensor head by using a prescribed measuring point extraction algorithm, and to compute a displacement according to the automatically extracted coordinate of the measuring point; and

25 a console unit formed integrally with or separately from the main unit for supplying various commands to the main unit;

*Spec*

the main unit further comprising display data editing means for editing at least part of data used from the time of obtaining the image until the time of computing the displacement for use as display data for an image monitor.

- 5 26. A displacement sensor system according to claim 25, further comprising an image monitor driven by the main unit according to the display data.
- 10 27. A displacement sensor according to claim 25, wherein the light section beam consists of a line beam, and the imaging device consists of a two-dimensional imaging device.
- 15 28. A displacement sensor according to claim 25, wherein the main unit further comprises means for defining a measuring range on the image obtained by the sensor head according to a prescribed manipulation of a control variable, and means for automatically extracting a coordinate of a measuring point from the image in the measuring range according to a prescribed measuring point extraction algorithm.